

# Project Report On

Python ChatBot Application

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I am thankful to my family whose unfailing love, affection, sincere prayers and best wishes had been a constant source of strength and encouragement.

Last, but not least, I thank my parents, for giving me life in the first place, for educating us with aspects from both arts and sciences, for unconditional support and encouragement to pursue my interests. I dedicate this work to our parents who will feel very proud of Me. They deserve real credit for getting us this far, and no words can ever repay for them.

Mahak Mishra

## **LIST OF ABBREVIATIONS**

ACH : Automated Clearing House ISP Internet service provide

OCC : Open Cash Credit

ATM : Automatic Teller Machine

JDBC : Java Database Connectivity

JSP : Java Server Page

HTML: Hypertext Markup Language

CSS : Cascading Style Sheet

IDE : Integrated Development environment DFD Data flow Diagram

UML : Unified Modelling language

SQL : Structure Query Language

# INTRODUCTION

## Chatbot

A chatbot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent. Designed to convincingly simulate the way a human would behave as a conversational partner, chatbot systems typically require continuous tuning and testing.

## Chatbot and Machine learning

Machine learning chatbots works using artificial intelligence. User need not to be more specific while talking with a bot because it can understand the natural language, not only commands. This kind of bots get continuously better or smarter as it learns from past conversations it had with people.

Here is a simple example which illustrate how they work. The following is a conversation between a human and a chatbot: Human: "I need a flight from San Jose to New York." Bot: "Sure! When would you like to travel?" Human: "From Dec 20, 2016 to Jan 28, 2017." Bot: "Great! Looking for flights."

## Artificial Intelligence

AI was coined by John McCarthy, an American computer scientist, in 1956 at The Dartmouth Conference where the discipline was born. Today, it is an umbrella term that encompasses everything from robotic process automation to actual robotics. It has gained prominence recently due, in part, to big data, or the increase in speed, size and variety of data businesses are now collecting. AI can perform tasks such as identifying

patterns in the data more efficiently than humans, enabling businesses to gain more insight out of their data.

## Natural Language Processing

Natural Language Processing (NLP) is the study of letting computers understand human languages[3]. Without NLP, human language sentences are just a series of meaningless symbols to computers. Computers don't recognize the words and don't understand the grammars. NLP can be regarded as a "translator", who will translate human languages to computer understandable information.

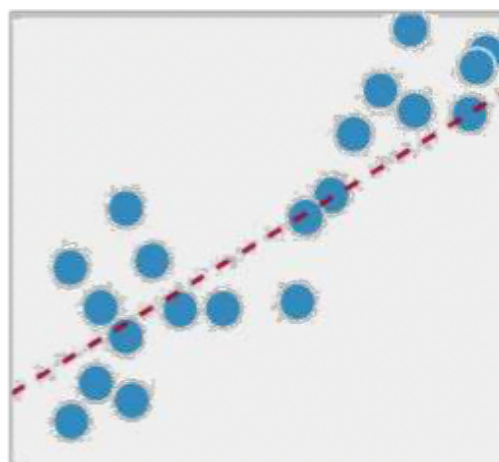
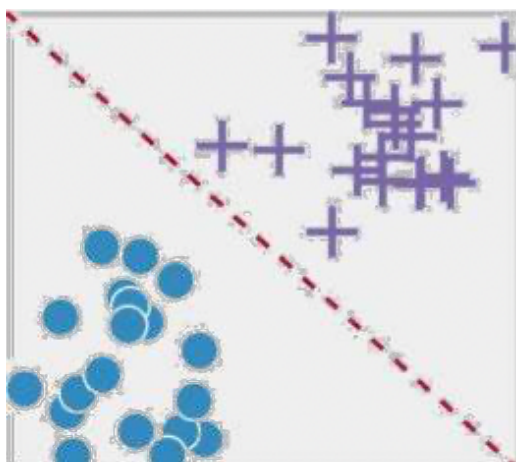
Traditionally, users need to follow well-defined procedures accurately, in order to interact with computers. For example, in Linux systems, all commands must be precise. A single replace one character or even a space can have significant difference. However, the emergence of NLP is changing the way of interacting. Apple Siri and Microsoft Cortana have made it possible to give command in everyday languages and is changing the way of interacting.

Purpose	Papers	Year of publications	Pros	Cons
Usefulness of chatbots	Bayan Abu Shawar and Eric Atwell, 2007 "Chatbots: Are they Really Useful?"	2007	<ul style="list-style-type: none"> <li>Significance of Chatbot</li> </ul>	Machine like Response
Natural language processing	Journal for Computational Linguistics and Language	2007	<ul style="list-style-type: none"> <li>Benefit of natural language processing in any AIML chatbot</li> <li>Detailed overview of Natural language processing mechanism</li> </ul>	<ul style="list-style-type: none"> <li>Technical and obsolete problems in Nlp mechanism</li> </ul>
Real time solution for Open learner model	Towards natural language negotiation of open learner models	2009	<ul style="list-style-type: none"> <li>Use of technology to enhance response.</li> </ul>	<ul style="list-style-type: none"> <li>Limited information</li> <li>Problem in integration</li> </ul>
Intelligent tutorial system	Whitepaper for the Army's Science of Learning Workshop, Hampton	2006	<ul style="list-style-type: none"> <li>Detailed description about Python and AIML</li> </ul>	<ul style="list-style-type: none"> <li>Only for chatbot based on Aiml</li> </ul>
Aiml and Brain loading	AI Chat Bot with AIML Submitted by NanoDano	2015	<ul style="list-style-type: none"> <li>Effective way of installation.</li> </ul>	<ul style="list-style-type: none"> <li>Slow brain loading</li> </ul>

## Machine Learning.

Machine Learning (ML) is an area of computer science that "gives computers the ability to learn without being explicitly programmed". The parameter of the formulas is calculated from the data, rather than defined by the programmer. Two most common usage of ML is Classification and Regression. As shown in figure1 [8], Classification means to categorize different types of data, while Regression means to find a way to describe the data. Basic ML program will have two stages, fitting and predicting. In the fitting stage, the program will be given a large set (at least thousands) of data. The program will try to adjust its parameter based on some statistical models, in order to make it "fit" the input data best. In the predicting stage, the program will give a prediction for a new input based on the parameters it just calculated out. For example, the famous Iris flower dataset [9] contains the measurement of several features of three different species of flowers, such as the length of sepals and petals. A well-defined ML program can learn the pattern behind this feature and give prediction accordingly.

Figure2a: Classification Figure2b: Regressing



## REQUIREMENTS AND SPECIFICATION

Hardware Requirements (minimum) :

Processor : Pentium IV / Catelina OS

Hard Disk : 8GB

RAM : 256MB (minimum)

Software Requirements:

MacOs/Windows/Linux : Pycharm CE (python 3)

### Libraries To be Installed

1.1 Chatterbot

1.2 Chatterbot.Corporus

1.3 python -m spacy download ("en")

## PROPOSED SOLUTION

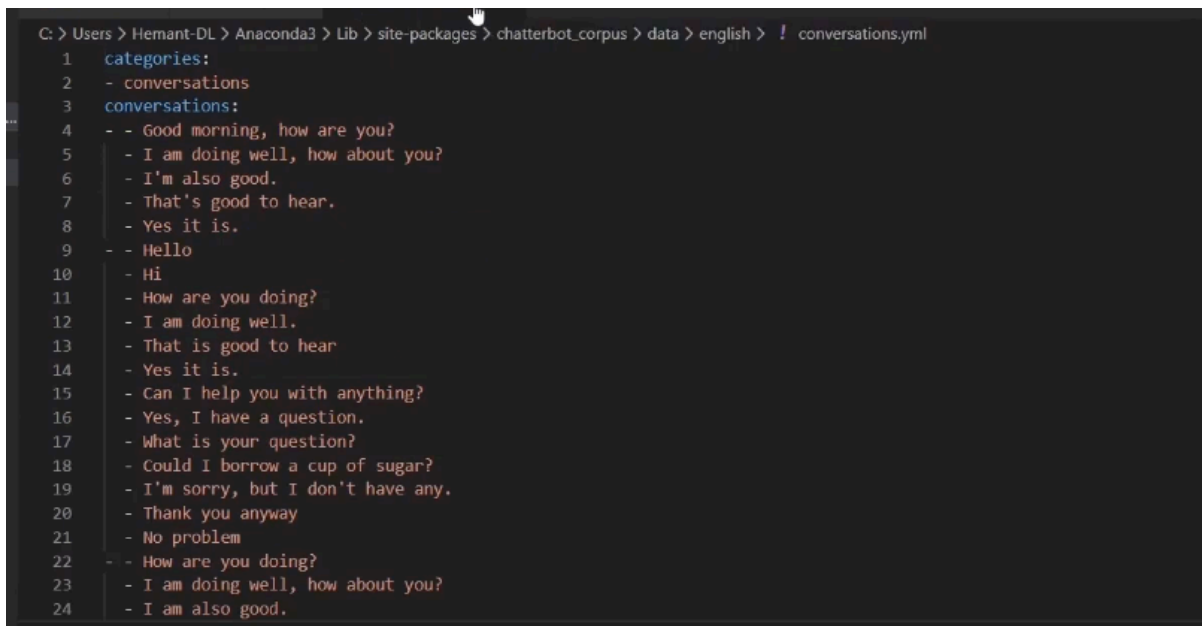
```
from chatterbot import ChatBot
from chatterbot.trainers import
ChatterBotCorpusTrainer

chatbot = ChatBot('bot')
```

We just Took 2 major ML based Libraries “chatterbot” & “chatterbot.trainers”. These libraries has inbuilt functions and programs that our ChatBot Uses (example:How are You?, have a great day etc).In there latter stage we have given a name to our ChatBot as “bot”.

```
trainer =  
ChatterBotCorpusTrainer(chatbot)  
trainer.train('chatterbot.corpus.english'  
)
```

In the above code we have extracted files form the dictionary “ChatterBotCorpusTrainer” in order to train the Bot with questions (It will be trained with programs from the dictionary itself).’chatterbot.corpus.english’ commends the trainer to train in English language.



```
C:\Users\Hemant-DL\Anaconda3\Lib\site-packages\chatterbot_corpus\data/english> ! conversations.yml  
1 categories:  
2 - conversations  
3 conversations:  
4 - - Good morning, how are you?  
5   - I am doing well, how about you?  
6   - I'm also good.  
7   - That's good to hear.  
8   - Yes it is.  
9 - - Hello  
10  - Hi  
11  - How are you doing?  
12  - I am doing well.  
13  - That is good to hear  
14  - Yes it is.  
15  - Can I help you with anything?  
16  - Yes, I have a question.  
17  - What is your question?  
18  - Could I borrow a cup of sugar?  
19  - I'm sorry, but I don't have any.  
20  - Thank you anyway  
21  - No problem  
22 - - How are you doing?  
23   - I am doing well, how about you?  
24   - I am also good.
```

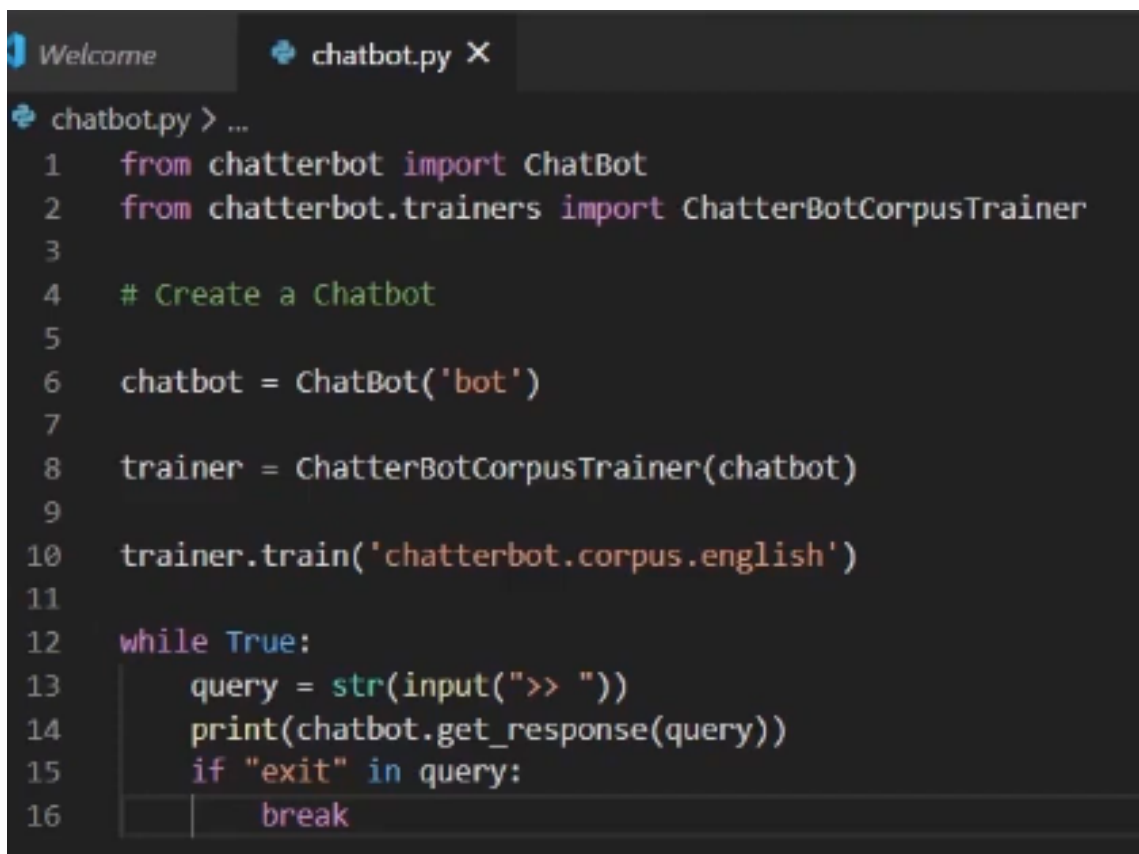
Where as it can be trained in any language as per the programer preference.

```
1.while True :  
2.    query = str(input ">> "))  
3.    print(chatbot.get_response(query))
```



```
4.     if "exit" in query:
5.         break
```

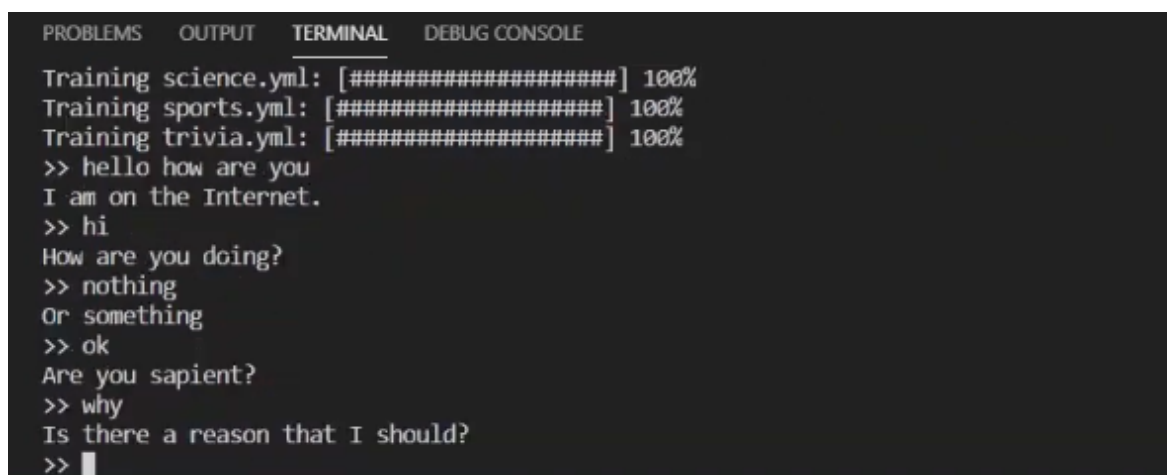
We used while loops as it will keep on asking the user again and again until user says “exit”. In line 2 we have asked the user to take the input which will be stored in “quary”. Line 4 says if the User commends “exit” the while loop will break and the program will terminate.

A screenshot of a code editor with a dark theme. The editor has two tabs at the top: 'Welcome' and 'chatbot.py X'. The 'chatbot.py' tab is active, showing a Python script. The script starts with a prompt 'chatbot.py > ...' followed by 16 lines of code. The code imports 'ChatBot' and 'ChatterBotCorpusTrainer' from 'chatterbot', creates a 'ChatBot' object named 'chatbot', and a 'ChatterBotCorpusTrainer' object named 'trainer'. It then trains the trainer on 'chatterbot.corpus.english'. A 'while True:' loop follows, where it takes user input, prints the chatbot's response, and checks if the input contains 'exit'. If it does, it breaks the loop.

```
chatbot.py > ...
1  from chatterbot import ChatBot
2  from chatterbot.trainers import ChatterBotCorpusTrainer
3
4  # Create a Chatbot
5
6  chatbot = ChatBot('bot')
7
8  trainer = ChatterBotCorpusTrainer(chatbot)
9
10 trainer.train('chatterbot.corpus.english')
11
12 while True:
13     query = str(input(">> "))
14     print(chatbot.get_response(query))
15     if "exit" in query:
16         break
```

Screen Shot of Full Program.

## OUTPUT Screen Shot159

A screenshot of a terminal window with a dark background. At the top, there are four tabs: 'PROBLEMS', 'OUTPUT', 'TERMINAL', and 'DEBUG CONSOLE'. The 'TERMINAL' tab is selected. The terminal shows the output of the chatbot program. It starts with three lines of training progress: 'Training science.yml: [#####] 100%', 'Training sports.yml: [#####] 100%', and 'Training trivia.yml: [#####] 100%'. Then, it shows a series of user inputs and chatbot responses. The user inputs are: '>> hello how are you', '>> hi', '>> nothing', '>> ok', '>> why', and '>>'. The chatbot responses are: 'I am on the Internet.', 'How are you doing?', 'Or something', 'Are you sapient?', and 'Is there a reason that I should?'. The terminal ends with a cursor prompt '>> '.

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE
Training science.yml: [#####] 100%
Training sports.yml: [#####] 100%
Training trivia.yml: [#####] 100%
>> hello how are you
I am on the Internet.
>> hi
How are you doing?
>> nothing
Or something
>> ok
Are you sapient?
>> why
Is there a reason that I should?
>> 
```

## OUTPUT

```
>> hello how are you
I am on the Internet.
>> hi
How are you doing?
>> nothing
or something
>> ok
Are you sapient?
>> why
Is there a reason that I should?
>>
```

## Advantages

### 1. Accessible anytime:

I'm sure most of you are always kept on hold while operators connect you to a customer care executive. On an average people spend around 7 minutes until they are assigned to a person. Gone are the frustrating days of waiting in a queue for the next available operative. They are replacing live chat and other forms of slower contact methods such as emails and phone calls. Since chatbots are basically virtual robots they never get tired and continue to obey your command. They will continue to operate every day throughout the year without requiring to take a break. This improves your customer UX and helps you rank highly in your sector. Another advantage of this instant response is that you can also skillfully craft your chatbot to maintain your image and brand.

### 2. Handling Capacity:

Unlike humans who can only communicate with one human at a time, chat bots can simultaneously have conversations with thousands of people. No matter what time of the day it is or how many people are contacting you, every single one of them will be answered immediately.

Imagine you own a restaurant, and you have a good reputation for your food of which most of your revenues come from delivery. As the demand keeps rising, you will have more customers to take orders from but very few staff to attend them all. Having a chatbot would eliminate such problem and cater to each and every person and ensure that no order is missed. Companies like Taco Bell and Dominos are already using chatbots to arrange delivery of parcels.

## **Disadvantages**

### **1. Too many functions**

Most of developers strive to create a universal chatbot that will become a fully-fledged assistant to user. But in practice functional bots turn out not to cope with the majority of queries. They often do not understand the user, forget what they were told 5 minutes earlier, and have many other disadvantages. And that is no wonder, as the development of a universal bot, which would understand natural language and could evaluate context, takes years of hard work for a team of experienced programmers. And even in this case, such programs should be constantly improved while in service.

However, modern technologies allow building rather useful bots to perform specific actions such as booking train tickets or providing support to bank customers.

## **2.Primitive algorithms**

There are two types of bots:

based on artificial intelligence, being able to learn in the process of communication; programmed for specific behavior scenarios.

Artificial intelligence chatbots are considered to be better, as they can respond depending on the situation and context. But the development of complex algorithms is required for this purpose. Meanwhile, only IT giants and few developers possess such powerful technological base.

Therefore, it would be better for ordinary companies to focus on the second variant of bots, as they are more reliable and simpler. Namely for the reason they do not possess intelligence, they will not be able to adopt rude communication patterns and get beyond the control of creators.

## **TECHNOLOGY**

### **ABOUT PYTHON:**

Dating from 1991, Python is a relatively new programming language.

From the start, Python was considered a gap-filler, a way to write scripts that “automate the boring stuff” (as one popular book on learning Python put it) or to rapidly prototype applications that will be implemented in one or more other languages.

### **What is Python used for?**

The most basic use case for Python is as a scripting and automation language. Python isn't just a replacement for shell scripts or batch files, but is also used to automate interactions with web browsers or application GUIs or system provisioning and configuration in tools such as Ansible and Salt. But scripting and automation represent only the tip of the iceberg with Python.

## The Python language's pros and cons :

Python syntax is meant to be readable and clean, with little pretense. A standard “hello world”

in Python 3.x is nothing more than:

- `print("Hello world!")`
- Python provides many syntactical elements that make it possible to concisely express many common program flows. Consider a sample program for reading lines from a text file into a list object, stripping each line of its terminating newline character along the way:
- `with open('myfile.txt') as my_file:`
- `file_lines = [x.strip('\n') for x in my_file]`

## Conclusions

### CONCLUSION AND FUTURE SCOPE

Chatbots are the new Apps! As we have discussed in the above deliverables, this project brings the power of chatbots to Yioop and enriches its usability. Chatbots in Yioop can give a human like touch to some aspects and make it an enjoying conversation. And they are focused entirely on providing information and completing tasks for the humans they interact with. The above mentioned functionality in all the deliverables is implemented and pushed in to Yioop code. By implementing the above mentioned deliverables I was able to add a basic chatbot functionality in to the Yioop. I.e., configuring and creating accounts for bot users with bot settings which is mentioned in deliverable 2, activating a bot whenever a user asks for it via post in a thread which is

discussed in deliverable 3 and as I discussed in deliverable 4, I have implemented a simple weather chatbot that gives weather information whenever a user ask and Fig. 3 tells that I was also able to converse with the bot in Yioop. I intend to enhance the system developed so far in CS298. Next step towards building chatbots involve helping people to facilitate their work and interact with computers using natural language or using set of rules. Future Yioop chatbots, backed by machine-learning technology, will be able to remember past conversations and learn from them to answer new ones. The challenge would be conversing with multiple bot users and multiple user

## **Future Scope**

There are limitations to what has been currently achieved with chatbots. The limitations of data processing and retrieval are hindering chatbots to reach their full potential. It is not that we lack the computational processing power to do so. However, there is a limitation on “How” we do it. One of the biggest examples is the retail customer market. Retail customers are primarily interested in interacting with humans because of nature of their needs. They don’t want bots to process their needs and respond accor.

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